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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Atty. Docket:

WILHELMUS H. BRULS ET AL **PHN 17,546**

Serial No.: **09/614,810** Group Art Unit: **2613**

Filed: **JULY 12, 2000** Examiner: **N.T. DIEP**

Title: **EMBEDDING AUXILIARY DATA IN AN INFORMATION SIGNAL**

Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

Enclosed is an original plus two copies of an Appeal Brief in the above-identified patent application.

Please charge the fee of $320.00 to Deposit Account No. 14-1270.

Respectfully submitted,

By _____
Russell Gross, Reg. No. 40,007
Attorney
(914) 333-9631

CERTIFICATE OF MAILING

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On Aug 7, 2003
(Date of Mailing)

By Elissa DeLucy
(Signature)

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Serial No.: **09/614,810**	Group Art Unit: **2613**
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Title: **EMBEDDING AUXILIARY DATA IN AN INFORMATION SIGNAL**

Honorable Commissioner of Patents and Trademarks
Arlington, VA 22313

APPEAL BRIEF

Sir:

The rejection of claims 1-21 is hereby being appealed, which are reproduced in the attached Appendix.

1. Real Party in Interest

The real party in interest is U.S. Philips Corporation, the assignee herein.

2. Related Appeals and Interferences

The Appellant is not aware of any appeals or interferences that relate to the present application.

3. Status of all Claims

Claims 1-21 are currently pending in the present

application. Claims 1-21 were submitted in the present application when originally filed. In the Office Action dated April 10, 2003, Claims 1-21 were finally rejected and thus are currently being appealed.

4. Status of Amendment

No Amendments were filed subsequent to the Final rejection of April 10, 2003.

5. Summary of the Invention

The present invention is directed to a method of embedding auxiliary data in an information signal. As described on page 4 of the present application, signal samples are transform coefficients obtained by transform coding the information signal and encoded into variable-length code words.

As can be seen from Figure 2, the method includes decoding a variable-length code word indicative of a selected coefficient, as described on page 5. As described on pages 5-6, modifying said selected coefficient so as to represent an auxiliary data symbol. Further, encoding the modified coefficient into a new variable-length code word and replacing the old code word by the new code word, as described on page 5.

The present invention is also directed to a method of retrieving auxiliary data from an information signal. As desibed on pages 5-6, signal samples are transform coefficients obtained by transform coding the information signal, modified so as to represent said symbols, and encoded into variable-length code words.

As can be seen from Figure 5, the method includes decoding variable-length code words indicative of selected coefficients,

as described on page 10. Further, retrieving each auxiliary data symbol from said decoded coefficients, as also described on page 10.

6. Issues Presented for Review

The Appellant respectfully requests that the Board of Appeals review the final rejection of Claims 1-2, 4-6, 13-14 and 16-21 under 35 USC 102 as being anticipated by Hartung et al. (The Article entitled "Digital Watermarking of MPEG-2 Coded Video In the Bitstream Domain). The Appellant also respectfully requests that the Board of Appeals review the final rejection of Claim 3 under 35 USC 103 as being as being unpatentable over Hartung et al. The Appellant also respectfully requests that the Board of Appeals review the final rejection of Claims 5 and 7-10 under 35 USC 103 as being unpatentable over Hartung et al. in view of Prior art Figure 1D of the present application.

7. Grouping of the Claims

The Appellant respectfully submits that Claims 1-21 either stand or fall together.

8. Arguments

Claims 1-2, 4-6, 13-14 and 16-21 stand rejected under 35 USC 102 as being anticipated by Hartung et al. (The Article entitled "Digital Watermarking of MPEG-2 Coded Video In the Bitstream Domain). Claim 3 stands rejected under 35 USC 103 as being

unpatentable over Hartung et al. Claims 5 and 7-10 stand rejected under 35 USC 103 as being unpatentable over Hartung et al. in view of Prior art Figure 1D of the present application.

In order to make a proper anticipation rejection under 35 U.S.C. 102, Section 706.02 of The MPEP requires that a reference must teach every aspect of the claimed invention either explicitly or impliedly. Further, in order to establish anticipation, it is incumbent upon the Examiner to identify in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. *Lindemann Mascinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458, (Fed. Cir. 1984).

In view of the above, it is respectfully submitted that the burden of showing that Hartung et al. anticipates all of the features recited in the claims has not been met. In particular, Hartung et al. neither explicitly nor impliedly teaches "modifying said selected coefficient so as to represent an auxiliary data symbol", as recited in Claims 1 and 17, and "transform coefficients obtained by transform coding the information signal, modified so as to represent said symbols", as recited in Claims 13, 18 and 20.

In responding to the above rejections, the Appellant initially pointed out that on page 2623, left column, lines 14-17, Hartung et al. only disclosed:

"After the inverse quantization, we have one quantized DCT coefficient of the current signal

yielding a watermarked DCT coefficient."

Based on the above disclosure, Hartung et al. adds the corresponding DCT coefficient from the transformed watermark block, yielding a watermarked coefficient. However, nowhere in Hartung et al. was it disclosed that the watermarked DCT coefficient represents any kind of symbol. In view of this, it was respectfully pointed out that Hartung et al. did not anticipate the presently recited "modifying said selected coefficient so as to represent an auxiliary data symbol" and "transform coefficients obtained by transform coding the information signal, modified so as to represent said symbols". Despite this point, the above rejections were maintained in the Final Office Action of April 10, 2003.

In maintaining these rejections, it was stated Figure 6 Of Hartung et al. clearly shows that "after the inverse quantization we have one DCT coefficient of the current block". It was further stated that we then add the corresponding DCT coefficient from the transformed watermark block in Hartung et al.

However, as described above, Hartung et al. only takes a coefficient from a watermarked block and adds it to the same coefficient in an unwatermarked block. Thus, it is evident that Hartung et al. does not modify the coefficient to represent any

kind of symbol. Therefore, it is respectfully submitted that Hartung et al. still does not anticipate the presently recited "modifying said selected coefficient so as to represent an auxiliary data symbol" or "transform coefficients obtained by transform coding the information signal, modified so as to represent said symbols", as required by the claims.

In view of the above-described distinctions, the Appellant respectfully submits that the invention of Claims 1-21 is neither anticipated nor made obvious by Hartung et al. alone or in combination with Prior art Figure 1D of the present application. Therefore, the Appellant respectfully requests that the final rejections of these claims be reconsidered and reversed.

Please charge the fee of $320.00 to Deposit Account No. 14-1270.

Respectfully submitted,

By Russell Gross

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A P P E N D I X

1. A method of embedding auxiliary data (XD) in an information signal (MP), comprising the step of modifying selected signal samples so as to represent respective symbols of said auxiliary data, characterized in that said signal samples are transform coefficients (c(i,j)) obtained by transform coding the information signal and encoded into variable-length code words, the method further comprising the steps of:

- decoding a variable-length code word indicative of a selected coefficient;
- modifying said selected coefficient so as to represent an auxiliary data symbol;
- encoding the modified coefficient into a new variable-length code word; and
- replacing the old code word by the new code word.

2. A method as claimed in claim 1, wherein said step of replacing the old code word by a new code word is omitted if said replacing causes the length of a given sequence of code words to substantially exceed the original length of said sequence.

3. A method as claimed in claim 1, further including a step of inserting dummy bits in a field provided by the format according to which the signal has been coded, if said replacing causes the length of a given sequence of code words to substantially fall short of the length of the original sequence.

4. A method as claimed in claim 2, wherein the auxiliary data includes data words each represented by plural combinations of data symbols.

5. A method as claimed in claim 2 or 3, wherein said given sequence is a slice of an MPEG video signal.

6. A method as claimed in claim 2 or 3, wherein said given sequence is a transport packet of an MPEG transport stream.

7. A method as claimed in claim 2 or 3, wherein said given sequence is the sequence of code words between clock reference time stamps which are accommodated in the signal.

8. A method as claimed in claim 1, wherein the selected coefficient is a differential DC coefficient representing the difference between DC coefficients of successive blocks of coefficients.

9. A method as claimed in claim 8, wherein the step of modifying the selected coefficient comprises adding such a value that the sum of differential DC coefficients of a given series of blocks is not substantially modified.

10. A method as claimed in claim 8, wherein the series of blocks is a slice of an MPEG video signal.

11. A method as claimed in claim 1, wherein said data symbols are represented by modulo-n values of the selected coefficients, where n is a predetermined integer.

12. A method as claimed in claim 11, wherein n=2.

13. A method of retrieving auxiliary data from an information signal, comprising the step of retrieving symbols of said auxiliary data from respective selected signal samples, characterized in that said signal samples are transform coefficients obtained by transform coding the information signal, modified so as to represent said symbols, and encoded into variable-length code words, the retrieving step comprising the steps of:

- decoding variable-length code words indicative of selected coefficients;
- retrieving each auxiliary data symbol from said decoded coefficients.

14. A method as claimed in claim 13, wherein plural combinations of data symbols represent the same data word.

15. A method as claimed in claim 13, wherein said data symbols are represented by modulo-n values of the selected coefficients, where n is a predetermined integer.

16. A method of recording an information signal on a storage medium, comprising the steps of:

- receiving a compressed information signal having signal samples in the form of transform coefficients obtained by transform coding the information signal and encoded into variable-length code words;
- embedding auxiliary data in said information signal, using a method as claimed in claim 1;
- recording said information signal with embedded auxiliary data on said storage medium.

17. An arrangement for embedding auxiliary data in an information signal, comprising means for modifying selected signal samples so as to represent respective symbols of said auxiliary data, characterized in that said signal samples are transform coefficients obtained by transform coding the information signal and encoded into variable-length code words, the arrangement further comprising:

- means for decoding a variable-length code word indicative of a selected coefficient;
- means for modifying said selected coefficient so as to represent an auxiliary data symbol;
- means for encoding the modified coefficient into a new variable-length code word; and
- means for replacing the old code word by the new code word.

18. An arrangement for retrieving auxiliary data from an information signal, comprising means for retrieving symbols of said auxiliary data from respective selected signal samples, characterized in that said signal samples are transform coefficients obtained by transform coding the information signal, modified so as to represent said symbols, and encoded into variable-length code words, the retrieving means comprising:

- means for decoding variable-length code words indicative of selected coefficients;
- means for retrieving each auxiliary data symbol from said decoded coefficients.

19. An arrangement for recording an information signal on a storage medium, comprising:

- means for receiving a compressed information signal having signal samples in the form of transform coefficients obtained by transform coding the information signal and encoded into variable-length code words;
- means for embedding auxiliary data in said information signal, using an arrangement as claimed in claim 17;
- means for recording said information signal with embedded auxiliary data on said storage medium.

20. An information signal with embedded auxiliary data, respective symbols of said auxiliary data being represented by selected signal samples, characterized in that said signal samples are transform coefficients obtained by transform coding the information signal, modified so as to represent said symbols and encoded into variable-length code words.

21. A storage medium having stored thereon an information signal with embedded auxiliary data as claimed in claim 20.